

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Globalstar, Inc.)	
)	RM-11685
Petition for Rulemaking to Reform the)	
Commission's Regulatory Framework for)	
Terrestrial Use of the Big LEO MSS Band)	

COMMENTS OF THE ASSOCIATION OF HOME APPLIANCE MANUFACTURERS

The Association of Home Appliance Manufacturers ("AHAM"), pursuant to Section 1.405 of the Commission's Rules and the Public Notice issued by the Commission on November 30, 2012, submits these comments in response to the above-referenced Petition for Rulemaking ("Petition") filed by Globalstar, Inc. ("Globalstar").^{1/} The Petition requests permission for Globalstar to offer a Terrestrial Low-Power Service ("TLPS") using frequencies for which it is already authorized to provide Mobile Satellite Service ("MSS") in the 2483.5-2495 MHz band and in the adjacent unlicensed Industrial, Scientific, and Medical ("ISM") spectrum at 2473-2483.5 MHz. It also contemplates providing a terrestrial service, using Long Term Evolution ("LTE") technology, in the 2483.5-2495 MHz band for base station (downlink) operations and in the 1610-1626.5 MHz band for mobile (uplink) operations.

AHAM appreciates the need for additional spectrum for mobile broadband services.

However, the Petition does not fully address Globalstar's obligation to accept interference that

^{1/} See Petition for Rulemaking of Globalstar, Inc., RM-11685 (filed Nov. 13, 2012) ("Petition"); *Consumer & Governmental Affairs Bureau Reference Information Center Petition for Rulemaking Filed*, Public Notice, Report No. 2971 (rel. Nov. 30, 2012). See also *International Bureau, Office of Engineering and Technology, and Wireless Telecommunications Bureau Grant Extension of Comment Deadline on Globalstar, Inc. Petition for Rulemaking*, Public Notice, DA 12-2026 (rel. Dec. 14, 2012) (extending the comment deadline to January 14, 2013).

may be caused by microwave ovens, which are authorized to operate in the band 2400-2500 MHz. Before the Commission permits Globalstar to proceed, it must make clear that Globalstar has no greater rights than any other user of the unlicensed spectrum in the 2473-2495 MHz band and that it, and its customers, are obligated to accept interference from microwave ovens operating in that band.

I. BACKGROUND

AHAM represents manufacturers of major, portable, and floor care home appliances, and suppliers to the industry. AHAM's membership includes more than 150 companies throughout the world. In the United States, AHAM members employ tens of thousands of people and produce more than 95 percent of the household appliances shipped for sale. The factory shipment value of these products is more than \$30 billion annually. The home appliance industry, through its products and innovation, is essential to U.S. consumer lifestyle, health, safety and convenience. Through its technology, employees, and productivity, the industry contributes significantly to U.S. jobs and economic security. Home appliances also are a success story in terms of energy efficiency and environmental protection. New appliances often represent the most effective choice a consumer can make to reduce home energy use and costs. There are 31 members in the major appliance division and about 12 of those companies are directly involved in the marketing and sales of, among other products, induction and microwave ovens, which are considered consumer ISM devices under the FCC Rules.^{2/}

AHAM members and the home appliance industry in general play an important role in the U.S. economy and the everyday lives of Americans. According to the U.S. Census Bureau,

^{2/} See 47 C.F.R. § 18.101(g).

96 percent of households report having a microwave oven, up from 82 percent two decades ago.^{3/} Therefore, any changes to the current regulatory framework governing ISM devices, including the approximately 115 million microwave ovens currently in use in the United States today, would impose significant costs on manufacturers and ultimately consumers.

The Petition requests that the Commission permit Globalstar to provide TLPS, utilizing the 2473-2483.5 MHz band, in conjunction with the 2483.5-2495 MHz band that it is already permitted to use, to offer MSS. It also proposes, on a longer term basis, the use of the band 2483.5-2495 MHz for LTE downlink and the 1610-1626.5 MHz band for LTE uplink use. The proceeding affects AHAM's members because ISM devices such as microwave ovens typically operate in the 2400-2500 MHz band, which includes the 2473-2483.5 MHz band in which Globalstar seeks to deploy TLPS and the 2483.5-2495 MHz band in which it seeks to provide LTE downlink services. Accordingly, AHAM is pleased to have the opportunity to submit these Comments, to ensure that any action on the Petition does not affect the rules governing microwave ovens and potentially cause costly redesign of these nearly ubiquitous appliances to the detriment of consumers.

II. COMMENTS

AHAM appreciates the need for additional spectrum to support increasing consumer demand for mobile broadband services. It therefore does not oppose a regulatory approach that encourages use of spectrum for wireless broadband applications where technically feasible. Additionally, AHAM recognizes that numerous devices presently coexist in the ISM band without significant interference problems. Nevertheless, if the Commission permits Globalstar to

^{3/} See ANNETTE L. ROGERS & CAMILLE L. RYAN, U.S. CENSUS BUREAU, EXTENDED MEASURES OF WELL-BEING: LIVING CONDITIONS IN THE UNITED STATES, 2003, at 3 (2007), *available at* <http://www.census.gov/prod/2007pubs/p70-110.pdf>.

deploy TLPS or LTE operations using the ISM band, AHAM urges the Commission to make clear that Globalstar has no more rights than any other user of the 2400-2500 MHz band and cannot complain about harmful interference caused by ISM devices, including microwave ovens, to its service.

Part 18 devices are equipment specifically used for industrial, scientific, and medical purposes, including induction cooking ranges, microwave ovens, and ultrasonic equipment.^{4/} The Commission has long found that ISM operations – which exist on a worldwide basis in the band 2400-2500 MHz – should be free from the requirements of curing harmful interference. Section 18.111(c) of the rules states that ISM devices operating in an ISM frequency band are not required to cure harmful interference to licensed devices operating within that frequency.^{5/} In other words, all Part 18 devices operating within the ISM band must do so without causing harmful interference to authorized radio services *outside* the band, but all radio services operating *inside* the ISM band are required to accept any interference received from Part 18 devices.^{6/} The 2400-2500 MHz band is dedicated for ISM operations.^{7/} Accordingly, Globalstar, like any other

^{4/} See 47 C.F.R. § 18.101(c), (g).

^{5/} See 47 C.F.R. § 18.111(c); *see also* *Overall Revision of the Rules Regarding Industrial, Scientific, and Medical (ISM) Equipment Under Parts 0, 2, and 18*, Third Report and Order, 58 Rad. Reg. 2d (P&F) 1096, Appendix B (1985).

^{6/} See *1998 Biennial Regulatory Review - Conducted Emissions Limits Below 30 MHz for Equipment Regulated under Parts 15 and 18 of the Commission's Rules*, Report and Order, 17 FCC Rcd 10806 ¶ 3 (2002) (“1998 R&O”) (“All Part 18 devices operate on a non-interference basis to authorized radio services, except that they must operate in frequency bands that have been specifically allocated for Part 18 operations. In these frequency bands, all other radio services are required to accept any interference received from Part 18 devices.”).

^{7/} See 47 C.F.R. § 18.301; *see also, e.g., Amendment of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz Bands*, Notice of Proposed Rulemaking, 21 FCC Rcd 2809, 2811 n.7 (2006) (“In addition to the 902-928 MHz band, U.S. ISM bands include the 6.765-6.795 MHz, 13.553-13.567 MHz, 26.957-27.283 MHz, 40.66-40.70 MHz, 2400-2500 MHz, 5.725-5.875 GHz, 24-24.25 GHz, 61-61.5 GHz, 122-123 GHz and 244-246 GHz bands.”).

user of the band, is required to accept harmful interference from ISM operations in the band.^{8/}

The Commission has reiterated this point on numerous occasions.^{9/} Globalstar has not demonstrated why the FCC should depart from that policy in this proceeding.

Other services have successfully shared the ISM band in the past and AHAM is optimistic that Globalstar will be able to do so when it offers both of its proposed services – LTE and TLPS. For instance, the Amateur Radio Service successfully shares spectrum with ISM equipment over the 2400-2450 MHz band in the lower end of the ISM band.^{10/} Likewise, MSS, Broadcast Auxiliary Service (“BAS”), and private radio licenses also effectively operate on the

^{8/} In its *Order* permitting MSS in the ISM band, the Commission cited the Loral/Qualcomm Partnership (“LQP”)’s conclusion that 2400 MHz MSS operations would not be adversely affected by ISM transmissions and held that MSS/ISM sharing was warranted. *See Amendment of the Commission’s Rules to Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands*, Report and Order, 9 FCC Rcd 5936 ¶¶ 142-144 (1994); *see also Allocation of Spectrum Below 5 GHz Transferred from Federal Government Use*, First Report and Order and Second Notice of Proposed Rulemaking, 10 FCC Rcd 4769 (1995) (“1995 R&O”) (stating that Loral/Qualcomm believed “that Part 15 and ISM use of the band will have minimal impact on MSS operations”).

^{9/} *See, e.g.*, 47 C.F.R. § 2.106 (designating the 2400-2500 MHz band an ISM band and stating, “[r]adiocommunication services operating within these bands must accept harmful interference which may be caused by these applications”); *Amendment of Parts 2 and 97 of the Commission’s Rules to Create a Low Frequency Allocation for the Amateur Radio Service; Amendment of Parts 2 and 97 of the Commission’s Rules Regarding an Allocation of a Band Near 5 MHz for the Amateur Radio Service; Amendment of Parts 2 and 97 of the Commission’s Rules Concerning the Use of the 2400-2402 MHz Band by the Amateur and Amateur-Satellite Services*, Notice of Proposed Rulemaking, 17 FCC Rcd 8954 ¶ 41 (2002) (“[I]ndustrial, scientific and medical (‘ISM’) devices operate in the 2400-2500 MHz band and other radiocommunication services operating in this band must accept interference caused by ISM devices.”); 1998 R&O ¶ 3 (“All Part 18 devices operate on a non-interference basis to authorized radio services, except that they must operate in frequency bands that have been specifically allocated for Part 18 operations. In these frequency bands, all other radio services are required to accept any interference received from Part 18 devices.”); 1995 R&O ¶ 25 (“Radio services operating within this [ISM] band must accept harmful interference that may be caused by ISM devices, which include a large number of microwave ovens commonly used in households”); *Amendment of the Commission’s Rules to Allocate Spectrum for, and to Establish Other Rules and Policies Pertaining to a Radiodetermination Satellite Service*, Report and Order, 58 Rad. Reg. 2d (P&F) 1416, Appendix E (1985) (finding that Private Land Mobile Radio Services, including local government, police, and fire radio services, were “subject to no protection from interference due to ISM devices”).

^{10/} *See Amendment of Parts 1, 21, 73, 74 and 101 of the Commission’s Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands*, Order on Reconsideration and Fifth Memorandum Opinion and Order and Third Memorandum Opinion and Order and Second Report and Order, 21 FCC Rcd 5606 ¶ 53 (2006).

ISM band without significant interference problems.^{11/} Wi-Fi systems have also been widely and successfully deployed on the ISM band.^{12/} Based on these existing uses, Globalstar may reasonably be able to use the band as it anticipates without interference from microwave ovens or other ISM devices.

Nevertheless, Globalstar proposes a new use of the band, albeit one that is similar to current Wi-Fi operations. There are theoretical findings of the potential impacts microwave ovens could have on Wi-Fi devices operating in the 2400-2500 MHz band, which should be kept in mind given Globalstar's proposed new use of the band.^{13/} In light of these known potential risks, which are inherent in the use of the ISM band, Globalstar must not be permitted to

^{11/} *Id.* ¶ 54 (finding that the “ability of these services to share the [ISM] spectrum suggests that it is not necessary to impose in-band restrictions on ISM equipment emissions”).

^{12/} *Id.* (noting that “[t]he success of Wi-Fi systems operating in the 2400 MHz band . . . has not been diminished by reported or anticipated interference from ISM operations”); *but see infra* note 13 (highlighting findings on the potential impact of microwave ovens on Wi-Fi devices in the 2400-2500 MHz band).


^{13/} *See, e.g.,* COMPUTER SIMULATION TECHNOLOGY, MAGNETRON AND MICROWAVE OVEN DESIGN TO SOLVE WI-FI-INTERFERENCE ISSUES (2012) (stating that radiated noise from microwave ovens may interfere with several communication systems operating in the 2450 MHz band, including Wi-Fi and Bluetooth); BABAK AZIMI-SADJADI, ET AL., GE GLOBAL RESEARCH, INTERFERENCE EFFECT ON IEEE 802.15.4 PERFORMANCE (2006) (concluding that residential microwave ovens can have an impact on interference and coexistence for IEEE 802.15.4 LR-WPAN systems operating in the 2400 MHz ISM band, but that they are very channel dependent); Mayank Kabra & Joseph Sarlo, Microwave Oven Interference with 802.11 (Mar. 23, 2006) (unpublished student paper, University of California San Diego) (finding that it is not possible to improve the performance of IEEE 802.11 WLAN signals significantly in the presence of microwave oven interference since the performance of IEEE 802.11 is already nearly optimal); Axel Sikora & Voicu F. Groza, *Coexistence of IEEE802.15.4 with Other Systems in the 2.4 GHz-ISM-Band*, 3 INSTRUMENTATION AND MEASUREMENT TECH. CONF. 1786 (2005) (concluding that the impact of microwave ovens on IEEE 802.15.4 LR-WPAN signals results in an enlarged packet error rate, but that the level of below 10 percent is not critical); Carla-Fabiana Chiasserini & Ramesh R. Rao, *Coexistence Mechanisms for Interference Mitigation in the 2.4-GHz ISM Band*, 2 IEEE TRANSACTIONS ON WIRELESS COMM. 964 (2003) (finding that the effect of microwave oven interference on the bit-error rate of WLANs operating at 2400 MHz is “quite significant,” but concluding that interference can be improved via so-called overlap avoidance schemes); Ad Kamerman & Nedim Erkoçevic, *Microwave Oven Interference on Wireless LANs Operating in the 2.4 Ghz ISM Band*, 3 8TH IEEE INT’L SYMP. ON PERS. INDOOR AND MOBILE RADIO COMM. 1221 (1997) (arguing that interference from residential microwave ovens radiating at frequencies close to 2450 MHz impacts the reliability of communication in the 2400 MHz ISM band). Globalstar appears to recognize the potential interference from microwave ovens to Wi-Fi devices. *See* Petition at 43. However, the Commission should still make clear that it, like Wi-Fi users, is obligated to accept that interference.

complain later that there is any interference to its operations – whether using the band for LTE or for TLPS. Any suggestion that microwave ovens or other Part 18 devices should be modified now or in the future in order to permit the type of operations that Globalstar envisions must be firmly rejected. Therefore, if the Commission permits Globalstar to use the ISM band in conjunction with its proposed LTE or TLPS services, it should make clear that Globalstar holds no superior position over other users in the ISM band and must accept any and all interference from devices operating within that band.

III. CONCLUSION

AHAM recognizes the benefits of the Commission making additional spectrum available to support the growing mobile broadband market. However, in so doing, the Commission must take into consideration its established spectrum policies. Services in the 2400-2500 MHz ISM band must tolerate interference from other devices, both licensed and unlicensed, operating within that band. Numerous devices successfully coexist with ISM devices under this standard and neither the Petition nor FCC precedent justifies straying from customary policy. Therefore, should the Commission permit Globalstar to leverage the 2473-2483.5 MHz band in conjunction with its spectrum in the 2483.5-2495 MHz band, or use its 2483.5-2495 MHz spectrum for LTE operations, it should make clear that Globalstar's position in the ISM band is not superior to other operators. Instead, Globalstar's devices must operate within the same parameters and tolerate the same interference as all other devices operating on the ISM band.

Respectfully submitted,


/s/ _____

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Certificate of Service

I, Kara D. Romagnino, do hereby certify that on this 14th day of January, 2013, I caused a copy of the foregoing Comments of The Association of Home Appliance Manufacturers, to be served via First Class U.S. Mail, postage prepaid, on the following:

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